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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/727,035	12/04/2003	Vladimir Vitalevitch Ivanov	081468-0307072	4850

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EXAMINER	
QUASH, ANTHONY G	

ART UNIT	PAPER NUMBER
2881	

DATE MAILED: 10/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/727,035	IVANOV ET AL.	
	Examiner	Art Unit	
	Anthony Quash	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-16 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-16 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 04 December 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moors [6,781,673]. As per claims 1,8,15, Moors [6,781,673] teaches an lithographic apparatus comprising an illumination system/method that provides a particle beam of radiation, a support structure that supports a patterning structure, the patterning structure configured to impart the beam of radiation with a pattern in its cross-section, a substrate support that supports a substrate, and a projection system that projects the patterned beam onto a target portion of the substrate, a radiation-production system that produces extreme ultra-violet radiation wherein particles produced as a by-product of extreme ultra-violet radiation production move substantially in a particle movement direction. See Moors [6,781,673] abstract, figs. 1-8,13-15b, col. 1 lines 1-25, 40-50, col. 2 lines 60-68, col. 4 lines 10 – col. 5 line 25, col. 6 lines 50-67, col. 7 lines 5-20,30-40, col. 8 lines 1-31, col.9 lines 20-60, col.10 lines 60-68, col. 12 lines 4-7,23-30, 40-68, col. 13 lines 1-5, and col. 14 lines 25-35. However, Moors [6,781,673] does not explicitly state a radiation collection system that collects extreme ultra-violet radiation, the radiation collection system being arranged to collect extreme ultra-violet radiation which radiates in a collection-direction, the collection-direction being substantially different from the particle-movement direction. Moors [6,781,673] does however teach

the particle being moved by an electric field in a direction that is different from the direction in which the extreme ultraviolet radiation moves EUV. In addition, Moors [6,781,673] also teaches that mirrors being arranged to collect the EUV radiation and direct it toward the mask wherein the direction in which the beam is deflected toward the mask is substantially different from the direction in which the contaminants (particles) are directed by the electrode. See Moors [6,781,673] figs. 1-8, 13, and col. 13 lines 44-50. Therefore it is the examiner's view that Moors [6,781,673] fulfills the applicants' claim of a radiation collection system, since the mirrors act as radiation collection systems in the same way as the mirrors of applicants' fig. 5.

As per claims 2,9, Moors [6,781,673] teaches the radiation-production system comprises two oppositely chargeable electrodes (11,12) that generate an electric filed there between, and the electric field substantially following an axial direction of the radiation-production system. See Moors [6,781,673] figs. 1 and 2. Here, it is shown that the radiation beam originating from the radiation source (LA) propagates along the x-axis and is then directed toward the mask. The electric field is directed toward the x-axis and therefore, it is the examiner's view that Moors [6,781,673] teaches the electric field being directed in the axial direction.

As claims 3,10, Moors [6,781,673] teaches the collection-direction being a radial direction of the radiation-production system. See Moors [6,781,673] figs. 1-2.

As per claims 4,11, Moors [6,781,673] teaches all aspects of the claim except for explicitly stating that the at least one of the electrodes being substantially ring-shaped, and an axis of each ring-shaped electrode substantially coinciding with the axial

direction of the radiation-production system. Moors [6,781,673] does however, teach the electrodes being capacitor like plates. See Moors [6,781,673] col. 8 lines 25-32. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have at least one of the electrodes be substantially ring-shaped, and an axis of each ring-shaped electrode to substantially coincide with the axial direction of the radiation-production system, since it has been held to be within the general skill of a worker in the art to select a known shape on the basis of its suitability for the intended use as a matter of obvious design choice.

As per claims 5,12, Moors [6,781,673] teaches the radiation-collection system having an optical axis substantially parallel to the axial direction of the radiation-production system. See Moors [6,781,673] figs. 1-2, 13.

As per claims 6,13, Moors [6,781,673] teaches the radiation-collection system having an optical axis substantially parallel to the radial direction of the radiation-production system. See Moors [6,781,673] figs. 1-2, 13.

As per claim 7, Moors [6,781,673] teaches the radiation-collection system comprising an optical system that provides the projection beam of radiation. See Moors [6,781,673] figs. 1-2, 13.

As per claim 16, Moors [6,781,673] teaches further generating an electric field along the particle-movement direction. See Moors [6,781,673] abstract, figs. 1-8,13-15b, col. 1 lines 1-25, 40-50, col. 2 lines 60-68, col. 4 lines 10 – col. 5 line 25, col. 6 lines 50-67, col. 7 lines 5-20,30-40, col. 8 lines 1-31, col.9 lines 20-60, col.10 lines 60-68, col. 12 lines 4-7,23-30, 40-68.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent Nos. 6,614,505 to Koster et al, 6,285,737 to Sweatt et al, 6,753,941 to Visser and U.S. Published Applications 2004/0032574 to Koster et al, 2003/0095623 to Singer et al, and 2002/0168049 to Schriever et al are considered pertinent to the applicants' disclosure. Koster [6,614,505] and Koster [2004/0032574] are considered pertinent due their discussion on lithographic projection apparatus, which contains means for blocking contaminant particles from entering the radiation beam. Sweatt [6,285,737] is considered pertinent due to its discussion on a condenser for extreme-UV lithography with discharge source, and means for minimizing contamination accumulation on collecting mirrors. Visser [6,753,941] is considered pertinent due to its discussion on a lithographic apparatus and device manufacturing method. Singer [2003/0095623] is considered pertinent due to its discussion on an illumination system that suppresses debris from a light source. Schriever [2002/0168049] is considered pertinent due to its discussion on a method and apparatus for generating high output power gas discharge based source of extreme ultraviolet radiation and/or soft x-rays.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Quash whose telephone number is (571)-272-2480. The examiner can normally be reached on Monday thru Friday 9 a.m. to 5 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (571)-272-2477. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A. Quash

9/27/04

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